Endoscopic recognition of the sessile serrated polyp to cancer sequence

Nasim Parsa, MD, Douglas K. Rex, MD

Sessile serrated polyps (SSPs), also called sessile serrated adenomas (SSAs), are the precursor lesions of 20% to 30% of colorectal cancers. The serrated polyp to cancer sequence occurs primarily in the proximal colon in the case of SSPs.

SSPs are abundant in the colon, being present in the proximal colon in 8% to 9% of screening colonoscopies performed by high-level detectors.[1,2] Most SSPs are not dysplastic, which favors the term "SSP" over "SSA" because the term "adenoma" is used to describe the conventional adenoma class of colorectal cancer precursors, which are uniformly dysplastic. The pathologist should designate SSP without dysplasia as "SSP without cytologic dysplasia." The endoscopic features of SSP include pale color, indiscrete edges, flat or sessile shape, and frequently an adherent cap of mucus (Figs. 1 and 2). Microscopically, both SSPs and hyperplastic polyps (HPs) are characterized by NBI International Colorectal Endoscopic Classification (NICE) type 1 features (Table 1).[3] The NICE classification does not distinguish endoscopically between HPs and SSPs. The Workgroup on Serrated Polyps and Polyposis (WASP) classification does describe features that distinguish SSP from an HP, including an irregular surface, indiscrete edges, a cloudlike appearance, and large open pits (Fig. 3).[4]

The first step in progression of SSP to cancer sequence is development of dysplasia in SSP. The SSP with cytologic dysplasia can be recognized endoscopically by a focal area demonstrating NICE type 2 features (Figs. 4-6). This lesion is further along in the serrated polyp to cancer sequence, and the endoscopist should search the surface of any SSP for features of dysplasia and make sure that SSPs with cytologic dysplasia are completely resected (Table 1).

The development of cancer in an SSP can be recognized endoscopically if residual SSP is visible on the lesion surface adjacent to the cancer (Fig. 7; Video 1, available online at www.VideoGIE.org). Thus, the entire progression of sessile serrated polyp to cancer may be recognized endoscopically and can help to guide endoscopic or surgical resection, as well as histologic and molecular analysis of pathology specimens.

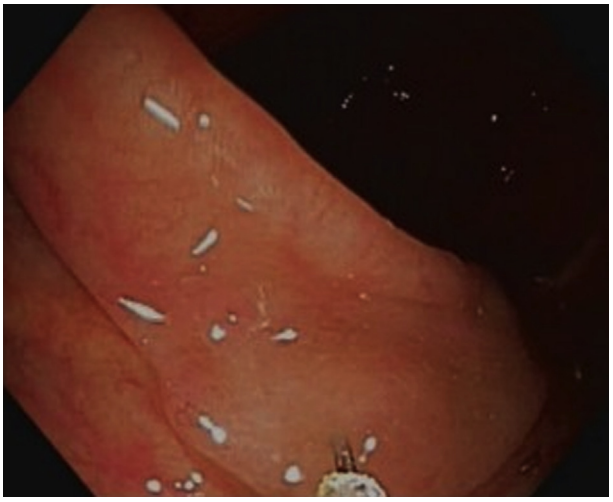

Figure 1. A sessile serrated polyp immediately before submucosal injection demonstrating pale color, indiscrete edges, and absence of surface vessels.

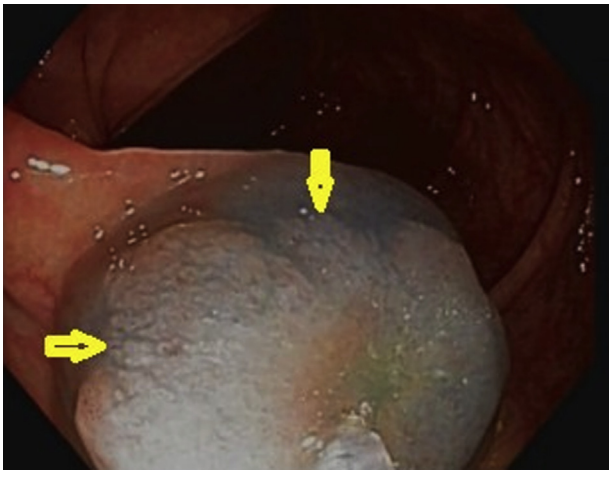

Figure 2. The same sessile serrated polyp during submucosal injection with a contrast agent. *Arrows* indicate the now clearly demonstrated margin of the lesion.

Written transcript of the video audio is available online at www.VideoGIE.org.

TABLE 1. Narrowband imaging (NBI) International Colorectal Endoscopic (NICE) Classification*

	Type 1	Type 2	Type 3
Color	Same or lighter than background	Browner relative to background (verify color arises from vessels)	Brown to dark brown relative to background; sometimes patchy whiter areas
Vessels	None, or isolated lacy vessels may be present coursing across the lesion	Brown vessels surrounding white structures**	Has area(s) of disrupted or missing vessels
Surface pattern	Dark or white spots of uniform size, or homogeneous absence of pattern	Oval, tubular or branched white structures** surrounded by brown vessels	Amorphous or absent surface pattern
Most likely pathology	**Hyperplastic & sessile serrated polyp (SSP)*****	**Adenoma******	**Deep submucosal invasive caner**

NICE, NBI International Colorectal Endoscopic Classification.
*Can be applied using colonoscopes with/without optical (zoom) magnification.
**These structures (regular or irregular) may represent the pits and the epithelium of the crypt opening.
***In the WHO classification, sessile serrated polyp and sessile serrated adenoma are synonymous. SSPs often demonstrate some dark, dilated crypt orifices.
****Type 2 consists of Vienna classification types 3,4, and superficial 5 (all adenomas with either low or high grade dysplasia, or with superficial submucosal carcinoma). The presence of high grade dysplasia or superficial submucosal carcinoma may be suggested by an irregular vessel or surface pattern, and is often associated with atypical morphology (e.g. depressed area).

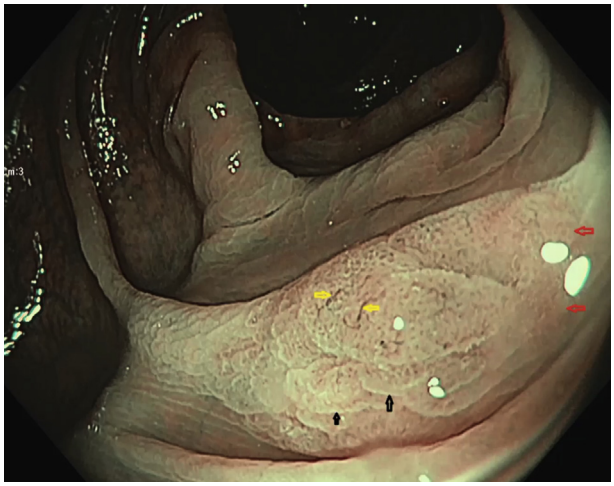

Figure 3. A sessile serrated polyp without cytologic dysplasia. *Red arrows* point to the indiscrete edges. *Black arrows* point to the cloudlike surface. *Yellow arrows* point to the rare blood vessels.

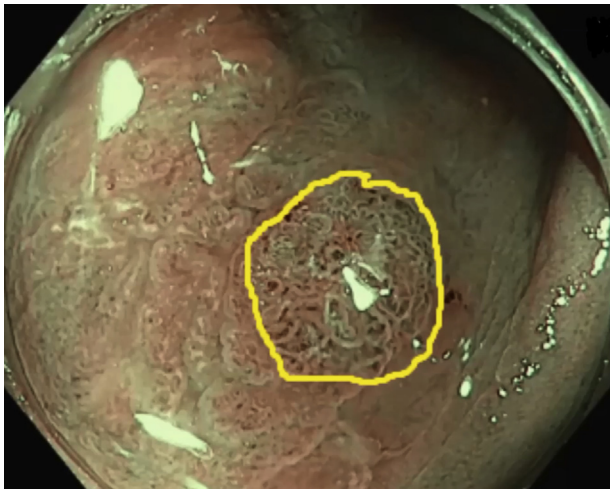

Figure 4. A sessile serrated polyp with cytologic dysplasia. The *yellow line* surrounds the dysplastic portion.

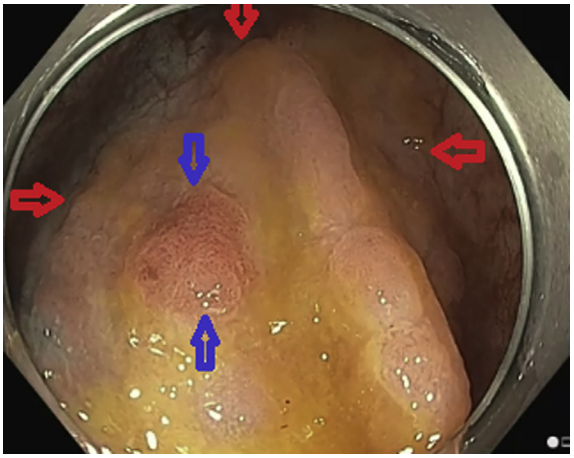

Figure 5. A sessile serrated polyp (SSP) with cytologic dysplasia. The *red arrows* delineate the margin of SSP. The *blue arrows* delineate the margin of dysplastic region, which has endoscopic features of a conventional adenoma. Note the adherent yellow mucus cap on the SSP portion.

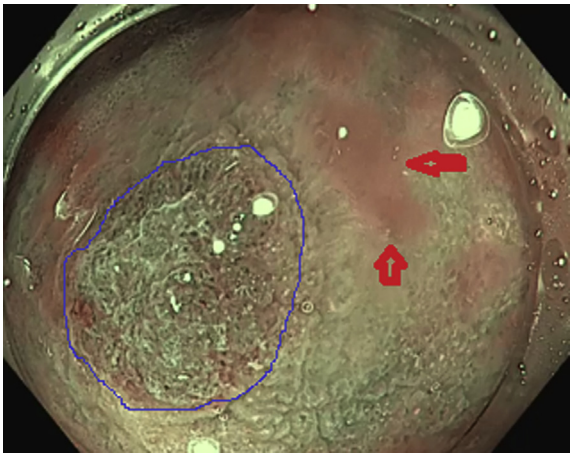

Figure 6. The same lesion seen in Figure 5 is now demonstrated in narrow-band imaging (NBI) and close focus (magnified view). The *blue line* delineates the margin of dysplastic focus. The *red arrows* point to portions of the mucus cap on sessile serrated polyp (SSP), which appears pink in NBI.

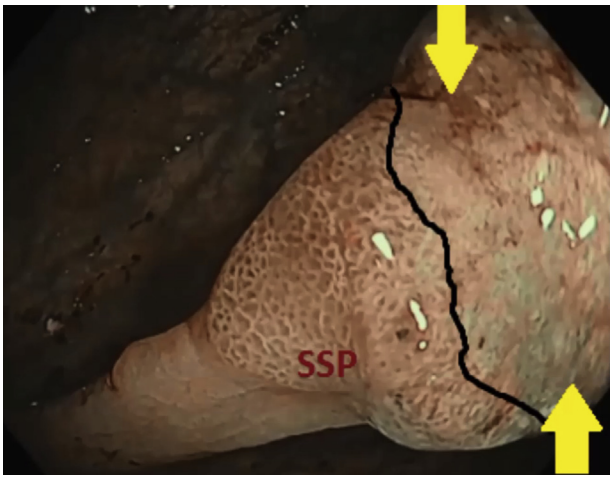

Figure 7. Cancer *(yellow arrows)* arising in a sessile serrated polyp (SSP). The benign SSP portion is to the left of the *black line*.

DISCLOSURE

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Abbreviations: HP, hyperplastic polyp; NBI, narrow-band imaging; NICE, NBI International Colorectal Endoscopic Classification; SSA, sessile serrated adenoma; SSP, sessile serrated polyp; WASP, Workgroup on Serrated Polyps and Polyposis.

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Indiana University School of Medicine, Indianapolis, Indiana, USA.

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